DOCUMENT RESUME

ED 415 497 CS 013 029

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TITLE Schemata as a Reading Strategy.
PUB DATE 1995-00-00
NOTE 40p.
PUB TYPE Information Analyses (070) -- Opinion Papers (120)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Elementary Secondary Education; English (Second Language); Foreign Countries; Higher Education; Reading Comprehension; *Reading Processes; Reading Research; *Reading Strategies; *Schemata (Cognition)
IDENTIFIERS *Schema Theory; *Text Processing (Reading)

ABSTRACT

Reading is a multileveled, interactive, and hypothesis-generating process in which readers construct a meaningful representation of text by using their knowledge of the world and of language. If reading involves grasping the significance of an input depending on the reader's mental cognitive-perceptual situation, then there is a form of background knowledge which is excited every time reading takes place. The most common form of comprehension experiments that allude to the presence of a background knowledge are those which touch upon the notion of "top-down" processing or"conceptually-driven" processing. Other studies on early language acquisition indicate that young children acquire language through "scripts"--a form of general event representation derived from and applied to social contexts. A schema: (1) provides ideational scaffolding for the assimilation of text; (2) provides selective allocation of attention; (3) allows inferential elaboration; (4) allows orderly searches of memory; (5) enables readers to provide summaries; and (6) permits inferential reconstruction. For some English-as-a-second-language (ESL) readers, the lower-level structural aspects of the text occupies their attention as they struggle with the language. Therefore, ESL reading teachers need to facilitate students' acquisition of all the language clues related to reading in a second language. As knowledge of what to teach is important to the ESL teacher, so is the knowledge of schema theory necessary to ensure better interfacing of what is in students' minds with what is on the printed page. (Contains 76 references and three figures; an appendix contains two illustrations and a text passage.) (RS)

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ED 415 497

ERIC

Reading, English and Communication

Monograph

Title: Schemata as a Reading Strategy

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Schemata as a Reading Strategy

by Zaliha Mustapha

> "Surface texts are replete with signals which generate hypotheses about how the meaningful concepts underlying the text depend upon each other.... Now, these signals are by no means determinate in giving a one-to-one match with concepts. They are more often several-to-several, with some matches being more probable or preferable to others. To constrain the range of possibilities, people will be likely to use cues in parallel.... Successful hypotheses are channelled back to the formation of new or more general ones."
>
> (de Beaugrande. 1978, p.7)

When we talk of reading strategies, we advertently have to assume that certain processes must also be involved that call for these strategies. In other words, we do not normally ask how we could improve, for example, our technique of story-writing if we are not involved in the writing process itself. Thus, in talking about comprehension and reading strategies, which this paper is trying to address, I am therefore inclined to begin with the reading process itself and then go through the kind of strategies that have been postulated and experimented upon in order to make the reading process more beneficial in terms of comprehension and retention of material read.

In the process of reading, a reader has to deal with printed words which make up sentences, paragraphs, and whole text. The question here is, how are these group of words

comprehended by the reader so as to give meaning to what has been read? To understand comprehension, therefore, we need to focus on the relationship between what is on the printed page--the input--and the reader's immediate cognitive-perceptual situation, i.e. the immediate mental information that is brought to the fore while intake is being processed. In this sense then, comprehension is the result of the interaction between input--the printed page-- and the immediate 'situation' that the reader is in. It is this 'situation' that we need to understand in reading comprehension. As Lasley has put it:

> "...input is never into a quiescent or static system, but always into a system which is already actively excited and organized...(and) behavior is the result of interaction of this background of excitation with input from any designated stimulus. Only when we can state the general characteristics of this background of excitation can we understand the effects of a given input-," (p.112).

So, what are the characteristics of this 'background of excitation'? A simple enough question (syntactically, at least) for the mature reader; but even as we read it, we know that since the system which we propose to understand is hidden from 'open' scrutiny, we can only hypothesize and deduce from what happens in the reading process itself.

Consider the following pair of sentences then:

"The students decided to invite their psychology teacher to the Thanksgiving party. They left when they found out that he is a vegetarian."

It is easy to accept the assertation that comprehension involves 'grasping meaning'. However, there are differences between knowing the meaning of a word or sentence and using information to understand a particular situation. In the short paragraph given above, the meaning of each lexical item is quite easy to grasp. However, as Jenkins (1974) warned, meaningfulness is not a property of stimuli. The so-called 'click of comprehension' (Brown,1958) cannot have happened by mere understanding of the different words that are used because a real understanding of those two sentences would require a comprehension of what a Thanksgiving party entails, what a vegetarian is, and why they (the students) left. In this sense, therefore, the reader's understanding of the passage will depend on his 'exciting' his previous knowledge of the different 'situations', i.e. Thanksgiving party, vegetarian; and how they are related to the input, the passage itself.

Here we will have to go back to Lashley's 'background of excitation'. If we accept the fact that reading involves grasping the significance of an input depending on the reader's mental cognitive-perceptual situation, then we will have to hypothesize that there is a form of background knowledge which is excited everytime reading takes place. Unfortunately, although all experimental research on comprehension occurs in some situation, this aspect is very seldom analyzed or taken into consideration.

The most common form of comprehension experiments that allude to the presence of a background knowledge (at least a form of it) are those which touch upon the notion of 'top-down' processing, or 'conceptually driven' processing (Norman, 1976). These experiments have suggested that there are top-down influences at most levels of processing including the extraction of visual information from the printed page, the recognition of words, and the processes that are employed to parse sentences. Among the well-known experiments in top-down processing are those which have been conducted (at the graphic level) by Marcel (1974) and Goodman (1976) who argue that context might facilitate the process of extracting visual features from the page. At the word recognition level, Morton (1964; 1969) expresses it in terms of his logogen model. Basically, he suggests that logogens are activated by context in exactly the same way as they are by visual information. Thus, if a word is highly predictable in a given context, the logogen count is incremented with the result that less visual information is required before the threshold is reached and the word is recognized. At the sentence parsing level, Fodor, Garrett and Bever (1968) propose that syntactic processing would be easier for sentences containing transitive verbs, i.e. for which only one structural hypothesis needs to be considered, than for sentences containing complement verbs, i.e. those which require two or more alternative hypotheses to be

considered. In other words, it is suggested that syntactic processing is influenced by the reader's expectations.

Other experiments that provide evidence for top-down processing have been carried out by Forster (1970) who showed the effects of context in which the text was degraded or distorted in various ways. Parfetti and Roth (1981) conducted an experiment in which stimulus clarity was reduced (by means of removing a proportion of the dots in a computer-controlled display of the target word). Their experiment showed that readers recognized a higher proportion of words when they appeared in context than when they appeared alone.

However, the question that needs to be asked at this juncture is, does context effect occur in normal reading situation? Before answering this question, it should be remembered that there are differences between comprehension in experimental situations (like those carried out by researchers mentioned before), and many everyday communication situations. One of the most important differences is between the use of language in the experimental situation and the conditions under which language is normally used. A mother, for example, does not sit down with a two year old child and say, "O.K.Billy, 'The boy hit the ball', 'John hit Mary'."(Example taken from Bransford and Nitsch, 1985). However, these same sentences could have been used in many comprehension experiments in

which adults' basic level of linguistic understanding is tapped. Nonetheless, these adults' performance would also hinge on their understanding of the experimenter's instruction so that they would be able to define their immediate 'situation' and thereby respond appropriately. Here, then, we are back to the 'situation' plus 'input' concept--that comprehension does not result from mere input, and that input has meaning only by virtue of its relationship to the person's current 'situation.' In this respect, Rosch et al's (1976) normative theories of knowledge, such as semantic memory theories, are extremely important because they provide reference points for what knowledgeable people know. In a relatively decontextualized knowing system, the adults are allowed to recognize an isolated sentence like 'The boy hit the ball'. They can treat inputs as examples or objects of logical analysis. In fact a number of studies have suggested that sophisticated comprehenders do indeed spontaneously invent situations in which sentences might be meaningfully analyzed (Bransford and Johnson, 1972; Johnson et al 1973).

The Script Theory

In the case of young children, the ability to invent situations is still not there. They will not understand nor will they ever acquire language given the previous decontextualized sentences of 'The boy hit the ball' and 'John hit Mary'. Children learn by understanding the

significance of utterances relative to their cognitive-perceptual situation at the time (Nelson, 1974). Other studies on early language acquisition seem to indicate that young children acquire language through what has been known as 'scripts' (Nelson, 1978, 1981; Schank and Abelson, 1977, 1979). A script is a form of general event representation derived from and applied to social contexts. They are built up as a person participates (or in other ways gains knowledge of, for example, through television viewing) in social routines. In the script theory, Schank and Abelson (1979) propose that part of our knowledge is organized around hundreds of stereotypic situations with routine activities, ea. eating at McDonalds, visiting a dentist, and so on. What is sequenced in a script are "scenes" which may be said to be a coherent series of actions that take place in a single setting, involving the same goal, people, and objects. So, if any of the components--goal, place, people, or objects--change, the scene changes. In a McDonalds' setting, for example, ordering, eating, and paying the bill would all be separate scenes because they involve different objects. Schank and Abelson, therefore, use the term script (an elaboration of Minsky's [1975] 'frame theory') to refer to the memory structure a person has in encoding his general knowledge of a certain situation.

Researchers like Bransford and Johnson (1972), Rumelhart (1975), and Anderson (1978), on the other hand,

propose the schema theory in the process of encoding, remembering and decoding. A "schema" is also a form of representation but it does not bear any isomorphic relation to real-world objects and events. Rather, it is a model of knowledge gained from experience, and each person's experience of a situation or event will be different. A "schema", therefore, is another form of script. This theory, first postulated by Bartlett (1932), was later revived by Rumelhart (1975). A fundamental assumption of this theory in the context of reading is that written text does not in itself carry meaning. Rather, a text only provides direction for the reader as to how he should retrieve or construct the intended meaning from his own previously acquired knowledge or experience. The words in a text evoke in the reader associated concepts, their past inter-relationships, and their potential interrelationships. The organization of the text helps him or her to select among these conceptual complexes. The goal of the theory then is to determine how the reader's knowledge interacts and shapes the information on the page and to determine how that knowledge should be organized to support the interaction.

It is therefore clear that 'context', 'script', and 'schema' are forms of control processors that determine comprehension of information. At the sentence level, context gives the reader the hypothesized 'situation' for the

processing of input. For example, the sentence "The haystack was important because the cloth ripped" (from Bransford and McCarrell, 1974), will be better understood in the context of a 'parachute'. A script on the other hand, invokes a 'setting' (ea. a restraunt) which then helps the reader to understand particular activities or incidences pertaining to a restraunt scene, for example; while a schema is a broader 'map of knowledge' which also provides settings or situations based on proper 'interfacing' of this map and the input.

With this then I take the readers back to the question that I posed earlier. Does context occur in normal reading condition? Now, if context is to be understood in a constrained manner, for example, the context effect at sentence level processing, then the answer is no. Studies by Gough et al. (1979), Mitchell and Green (1980), McConkie and Zola (1981), to name a few, have shown that although contextual effects seem to occur under normal or near normal reading condition, they are not the result of the more global top-down processing. However, if context is viewed as an overall ' scheme '--that which highlights and helps in focussing attention on particular aspect of what is being read, then the answer is yes. Reading to my understanding is not mere association of words (which reminds me of Lashley's [1951] criticisms in The Problems of Serial Order in Behavior). In normal reading, the extraction of the gist of

what has been read is more important than remembering every word that is in the reading material, and since most reading materials are lengthy, there must be a device which the reader makes use of to help him or her focus on what is and is not relevant.

This notion of a reading device has been clearly demonstrated by Bransford and McCarrell (1974) who state that "...Comprehension results only when the comprehender has sufficient alinguistic information to use the cues specified in linguistic input in order for him to create some semantic context that allows him to understand," (p.246). A series of experiment by Bransford and Johnson (1973) further illustrate this point.

For example, in one experiment, subjects were given a passage concerning a young man's use of balloons to serenade a young woman living in a high-rise apartment. Upon hearing the passage with no context provided, subjects could remember little of it. In another condition, subjects were shown a picture before hearing the passage. After the reading, subjects could remember the passage easily; the picture enabled them to 'excite' appropriate background knowledge to use in interpreting the passage. (See Appendix A).

So, in normal reading, context effect, if used isomorphically as 'schematic effect', is prevalent. It is

this schema that Lashley referred to as the "background of excitation".

The notion of schema, however, could best be understood if the reader is familiar with the concepts of propositions, and propositional links (Kintsch and van Dijk, 1978). Propositions are the basic units of meaning which express essentially the immediate content of a passage, i.e. the text input itself. Propositions are normally ordered sequentially and coherently and contain predicates (or relational concepts), and arguments. Predicates are realized in the surface structure as verbs, adverbs, and sentence connectors whereas arguments fulfill different semantic functions, such as agent, object, and goal. Predicates can constrain the nature of arguments that they may take through the linguistic rules and general world knowledge that are assumed to be part of a person's knowledge or semantic memory (Kintsch, 1974). However, for the theory to work, any text base given to the reader must be coherent. Thus, propositions must be related to one another, i.e. there must be propositional overlaps so as to give the text referential and semantic coherence.

However, according to Kintsch and van Dijk, text referential and semantic coherence cannot be performed on the text as a whole because of limited working memory capacity. A reader, therefore, tends to 'chunk' a certain number of propositions depending on propositional overlaps

and the surface characteristics of the text given. Evidence from Jarvella (1971), and Aaronson and Scarborough (1977) show that chunking itself will depend on the phrase and sentence boundaries prevalent in the text, and the characteristics of the reader. From here then, chunks of information will be stored in the 'buffer' zone in the short term memory where they will be connected with new incoming chunks if a connection is found between them. If not, a resource-consuming search of all previously processed propositions is made. If the search is successful, i.e. if a proposition is found that shares an argument with at least one proposition in the input set, the set is accepted and processing continues. If no proposition overlap is found, inference processing will then be initiated, which adds to the text base one or more propositions that connect the input set to the already processed propositions. The whole process (helped by macro-operators or processors) continues in cycles until the text is completed, after which, propositions will be condensed into a gist and stored in long term memory.

What has been described so far is part of a model given by Kintsch and van Dijk (1978) which they refer to as a 'text base'. Apart from understanding the importance of propositions and propositional overlaps in the retention of a text, the reader should also understand that propositions at higher nodes (or in the higher hierarchy) are usually

more important than those at the lower nodes, and are, therefore, better recalled. It will also be necessary to understand that the processing of the text base is under the control of 'schema', i.e. it is schema, which can be in the form of 'story-grammar' (a subject that will be touched upon later), the specific purpose for reading, or the kind of decision-making required after reading is completed, that determines the selection of propositions that will be incorporated into the buffer and finally into the condenser and long term memory. At this juncture, it will also be important to know that, sometimes, in the process of constructing, deleting, generalizing, and making inferences on propositions, the reader may also generate new texts based on their own comprehension of the text read. Thus, one can expect a direct reproduction of a text, or a text that has undergone certain transformation, or even a text that has been reconstructed through the process of the reader's own 'addition', 'specification', 'particularization', and or even 'biases'. Similar text can, therefore, be rendered differently by different readers based on the kind of background or world knowledge that they possess.

Many studies based on the schema-theory have been conducted by researchers like Kolers (1973), Clark (1977), Kozminsky (1977), and Kieras (1978, 1980). In a study by Kieras (1982), the notion of schema-oriented research is discussed. The main hypothesis of his experiment is that

readers do make use of propositions and propositional overlaps in reading comprehension. In his experiment, he showed that readers seemed to be computing the relations between propositions using a problem-solving approach known as the 'Given-New Strategy' (Haviland and Clark, 1974). According to the Given-New Strategy, reading is processed by the reader linking what is new with what is already known, and this process is facilitated by the macro-operators (operating at the text-base level) which, with the help of general knowledge, will then condense the micropropositions down to a relatively few macropropositions. These macropropositions then express the gist or important content of the passage, and they are then put into memory. Kieras' experiment also showed that when subjects were asked to recall the passages read, only the macropropositions were retrieved and general knowledge was used to reconstruct some of the micropropositions, which turned out to be quite different from those originally presented. Of interest, too, subjects were making certain hypotheses of what the passages were about, and having made those hypotheses, they then made use of their previous knowledge (or their schemata) to either accept or reject incoming micropropositions. Only those micropropositions that interface well with their previous knowledge were incorporated and used to build up their macropropositions.

The results from Kieras' study seem to complement the result of an experiment carried out by Kintsch, Kozminsky, Streby, McKoon, and Keenan (1975). Although the main concern of their experiment was to examine what aspect of the reading text aids recall, it also showed that it was easier for readers to process and retain in memory a proposition that is build up from old, already familiar element than to process propositions which introduce new concepts into the text.

Another form of schema that has sought the interest of many researchers is "story-grammar". In a different study by Mandler and Johnson (1977), the use of the structure of the text, or 'story-grammar', in the process of encoding and recall was studied. Story-grammar, as defined by Mandler and Johnson, is an idealized internal representation of the parts of a typical story and the relationships among those parts. It is also commonly known as story schema. Mandler and Johnson conducted an experiment based on Rumelhart's (1975) characterization of story-grammar. In Rumelhart's story-grammar, syntactical rules help to generate the internal structure of stories and the corresponding set of semantic interpretation which then determine the semantic representation of the story. Rumelhart also presents the structure of stories graphically in a tree diagram (Figure 1) showing the order of story elements.

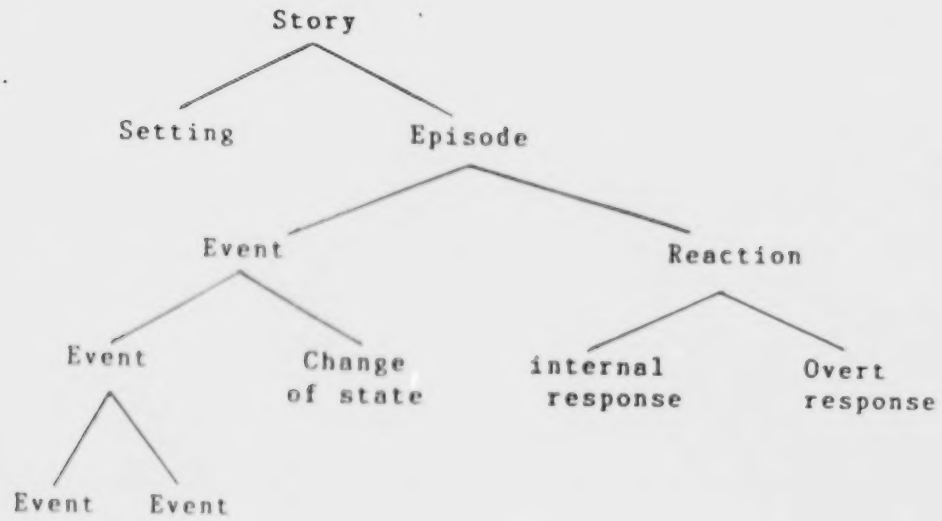


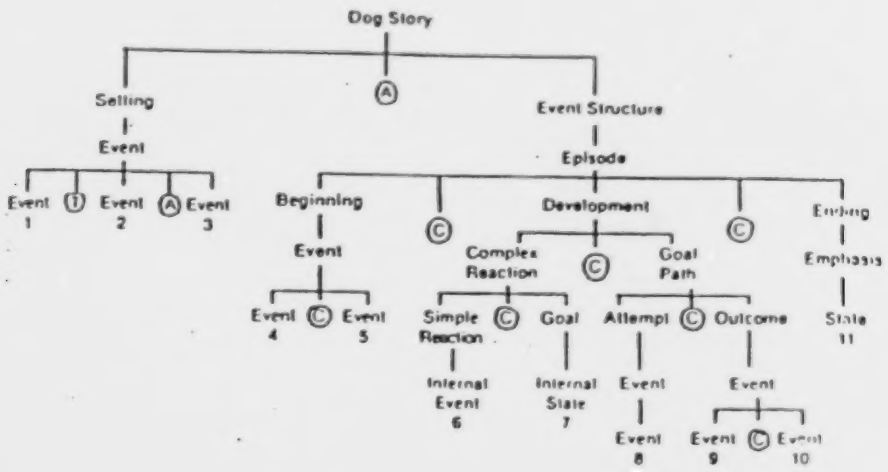
Figure 1

The syntactic structure of the story (Rumelhart, 1975, p.217)

Unlike Rnmelhart's tree diagram, Mandler and Johnson's story-grammar consists of 'terminal nodes' which are 'states' or 'events' that correspond to the surface structure of the story. The connections between these nodes can either be and (when nodes are related by concurrence or temporally), then (when two nodes are temporally connected), or cause (when the first node provides a reason for the second). Graphically, their story-grammar will look like the one shown in Figure 2.

Figure 2

Underlying structure of a simple story (Mandler and Johnson)



The connections and then, and cause have been abbreviated to A, T, and C and encircled. The numbers under the terminal nodes refer to the story's surface statements.

(1) It happened that a dog had got a piece of meat (2) and was carrying it home in his mouth (3) Now on his way home he had to cross a plank lying across a stream. (4) As he crossed he looked down (5) and saw his own shadow reflected in the water beneath. (6) Thinking it was another dog with another piece of meat (7) he made up his mind to have that also (8) so he made a snap at the shadow (9) but as he opened his mouth the piece of meat fell out (10) dropped into the water (11) and was never seen again.
(Mandler and Johnson, 1977, p. 119)

In their listening experiment, Mandler and Johnson found that their subjects did make use of story schemata (their preferred terminology in referring to story grammar) to guide encoding and retrieval processes. However, the

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effects of story schemata in their subjects were more apparent during retrieval than during encoding. This is especially true when stories given to them had poor structures, i.e. where nodes were omitted or causal connectors were replaced by temporal ones. In this case then, the longer the delay between telling and recall, the more recall came to approximate an ideal schema instead of the actual story heard. The form of recall given by their subjects only points to the fact that where there was no recourse to text as an aid in their remembering, subjects resorted to that which was already part of their 'schematic' knowledge, and conformation or distrotion of the story will depend on the schema that was activated.

In summary, a schema, as postulated by Anderson (1978), and Anderson and Pichert (1978), has the ability to function in the following manner:

1. It provides ideational scaffolding/bridging (Clark, 1977) for the assimilation of text.
2. It provides selective allocation of attention, i.e. it directs attention to certain aspects of the incoming material.
3. It allows inferential elaboration.
4. It allows orderly searches of memory, i.e. it provides the reader with a guide to the types of information that need to be recalled.
5. It enables the reader to provide summaries that include significant propositions and omit trivial ones.
6. It permits inferential reconstruction, i.e. when there is a gap in the memory, a reader's schema, along with the specific text information that can be recalled, helps generate hypotheses about the missing information.

If we look back into what happens during reading, we will find that as individual words are scanned from left to right (or right to left, depending on the language the reading text is in), most of them are accessed. Access is achieved through the inter-action of lower-level information, including levels of representation corresponding to visual features, letters, phonemes, and words (Gough, 1985). Activation spreads among these levels whether initiated by stimulus information or contextual information. The encoding of word meanings is the major outcome of lexical access, and as enough words are accessed, their encodings are included in the propositions that reflect the elementary meaning units of a text. The basic level of comprehension includes assembling and integrating propositions in working memory. It is at this level that comprehension, under the influence of schemata, is heavily influenced by the reader's knowledge.

Spiro (1980) has outlined several distinct ways in which the availability of schemata (or knowledge structures) can be understood to effect reading ability. These ways include the individual's acquisition of schemata of sufficient number and generality to apply to many different texts (called 'schema acquisition'), and the ability to apply the right schema in the right situation (or 'schema selection'). In addition, the reader often needs to modify his or her application of a schema during reading; to 'fill

in' his general idea of what a text is about (known as 'schema instantiation and refinement'), and even to change schemata or combine them whenever necessary. These processes, as postulated by Spiro, can only be carried out by the more mature readers. Experiments by Mandler (1978), Mandler and DeForest (1979), and McGee (1982) have shown that awareness of text structure develops with age. As a child grows older, reading becomes more "automated" (Kintsch and van Dijk, 1978) and schema selection, schema instantiation, and schema refinement will become fast and natural.

When schemata is considered in this manner, as knowledge structures that the reader not only needs to have but also must use appropriately, we will then realize that the application of knowledge is critical in reading because it is a very highly interactive process which cannot be adequately described solely top-down or bottom-up processes. What is understood or remembered of a text is not a verbatim message tied to the words used, but a rich mental construction 'strategically' borrowed, to a large extent, from the reader's existing knowledge. The reader's understanding will be further enhanced if he or she knew the rules set out by the writer. This knowledge will further help him or her to success if he or she continues to participate in this so-called reading game, alluded to as

the "Psycholinguistic Guessing Game" (Goodman, 1970). According to Goodman,

> "...(Reading) involves an interaction between thought and language. Efficient reading does not result from precise perception and identification of all elements, but from skill in selecting the fewest, most productive cues necessary to produce guesses which are right the first time," (p.108).

At the same time, the evidence obtained from experiments that have been briefly described in this paper suggest that when a person reads a passage, he constructs an internal representation which corresponds to the meaning of the text which are called propositions, and understanding the passage will depend on the number of proposition overlaps, semantic connections, and textual coherence. These, plus the schematic mapping and general knowledge that the reader has, form the 'chips' that will help the reader complete the picture of a text.

Having thus elaborated on the importance of schemata in reading, how is the reading teacher expected to use this knowledge? Should he or she proceed to drawing tree diagrams showing the interrelatedness of nodes and so on? A study by Sebesta, Calder, and Cleland (1982) on young children have shown that using a story-grammar and diagramming the story-structure did not improve the children's story comprehension. The same should hold true for the more mature readers though no research has yet been conducted on this issue. However, what is important to the teacher is understanding the concept of schemata and how he or she can

make use of this understanding to facilitate reading. This understanding is of paramount importance not only to reading in the first language (L1) but also in the second language (L2). In L2 reading, failure to comprehend a reading passage can be attributed to not only language but content. If readers are ignorant of social relationships and how language functions in various social settings, comprehension will be affected. If they fail to understand the story schemata prevalent in different societies, they will also stumble in their reading. Researches by Steffensen, Joag-Dev, and R.C. Anderson (1979), Reynolds, Tylor, Steffensen, Shirey, and R.C. Anderson (1981), and B.V. Anderson and Gipe (1983) have already confirmed the influence of cross-cultural schemata in L1 and L2 reading.

Steffensen, Joag-Dev and Anderson (1979) presented separate letters about American and Indian weddings to university students whose native culture was either American or Indian. Since wedding customs differ in America and India, subjects tend to recall information that was most relevant to their own culture. In addition, when recalling information about a culturally unfamiliar text, subjects tend to distort information and insert ideas from their own culture. Subjects were also found to elaborate the passages related to their own cultural experiences, and to read them faster.

In another study, Reynolds et.al.(1981) showed the role of L1 cross-cultural schemata in the reading of eighth-grade students from two populations; urban, working-class black students and white students from an agricultural community. Both groups read a letter describing an incidence that happened in a cafeteria. The letter included verbal insults such as "you so ugly that when the doctor delivered you, he slapped you in the face." While black students interpreted the episode to include verbal insults commonly found in the black community, the white students inferred that there was physical aggression. It is clear then that these two cultural groups tended to interpret the same passage differently although they come from the same language background.

Anderson (1981) and Anderson and Gipe (1983) also showed that readers tend to perform better on passages that matched their own cultural background. Anderson and Gipe presented their readers with a passage on Greek Name Day festivities. Although the passsage was easy to read, the significance of certain events was difficult to infer when readers were not familiar with Greek custom and tradidition.

In another interesting study, P.Carrell (1981) showed the effects on comprehension and recall of English stories by adult advanced ESL (English as a Second Language) readers based on the cultural origin of the stories given for them to read. Carrell gave two groups of students; Chinese and

Japanese, stories in English which have been translated from Chinese, Japanese, French, and American Indian folktales. The result showed that where story schemata differed drastically from that of their own culture, students ranked comprehensibility of the passages concerned as low. Their rewriting of those stories was also ranked low in comprehensibility by American native speakers. Johnson (1981) found similar effects of the cultural background of a text on reading comprehension. By examining the language complexity and the cultural origin on prose on the reading comprehension of Iranian students (intermediate and advanced ESL students at university level), she found that the level of syntactic and semantic complexity of the stories had a lesser effect on reading comprehension than did the cultural origin (Iranian versus American folktales) of the story.

The results of all these studies and of the view of reading comprehension as an interactive process (between the reader and the text, and within the reader's own text-base processing starategies [Kintsch and van Dijk, 1978]) lead to several implications for the ESL profession. If the cultural origin of a text has an effect on reading comprehension, then this fact must necessarily be considered as a criterion in the selection of reading materials and also in the evaluation of reading comprehension. Findings by Morrow (1982) have shown that knowledge of the schema theory is of particular importance to teachers who are responsible for

recommending materials for beginning reading instruction. Bruce (1978), on the other hand, feels that failure to understand any form of schemata on the part of the reading teacher could be an important factor in reading disability in young children. Whaley (1981) also suggests that a teacher, who has a knowledge of the importance of schema, could device instructional tasks that would make readers aware of the causal relationships in story structures.

General Summary

Reading is a multileveled, interactive, and hypothesis-generating process in which readers construct a meaningful representation of text by using their knowledge of the world and of language. The component of world knowledge is the schemata, and that of language is lexicon, discourse, syntax, morphology, phonology, and orthography. Although this paper has not gone into the various components that made up language, their knowledge is nevertheless necessary in reading. (Figure 3 will illustrate the importance of the language components in reading between beginning and advanced readers).

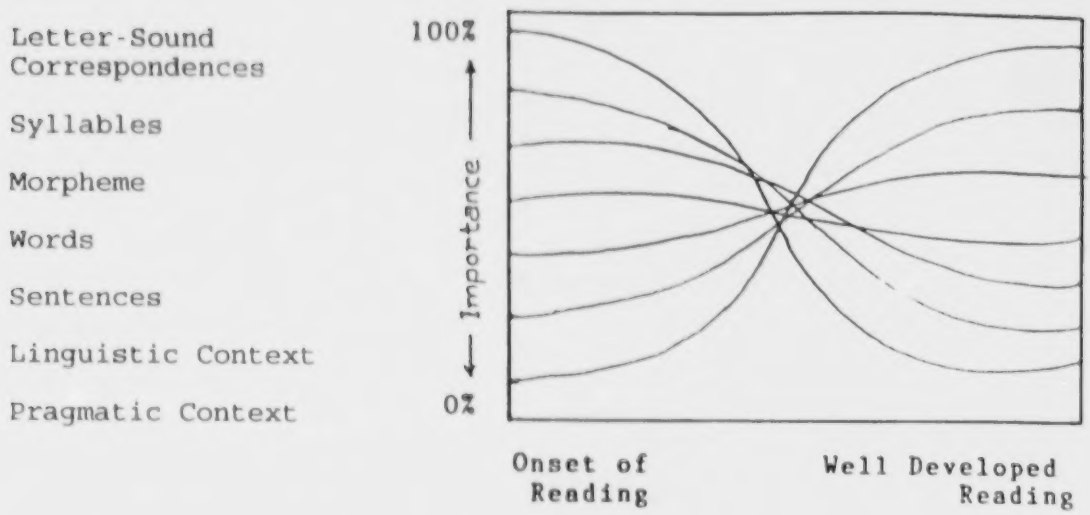

Figure 3. A schematic diagram of the role of language accesses in beginning reading and well-developed reading (From R.Shuy, 1977)

(The diagram above, though not a description based on research, illustrates the role of various levels of language at the onset of learning to read and at the level of the fluent reader. For the young child learning to read, there is a stronger tendency to be concerned with letter-sound correspondence, syllables, morphemes, and words than with larger units. Fluent readers, on the other hand, depend on higher-level cues involving the linguistic and pragmatic context).

For some ESL readers, the lower-level structural aspects of the text will probably occupy their attention as they struggle with the language, thus preventing them from accessing much information from the more meaning-driven accesses to reading. Therefore, ESL reading teachers need to facilitate students' acquisition of all the language

clues related to reading a L2. However, this does not imply that ESL readers must be totally fluent in L2 before learning to read it. Flores (1982) has indicated that language differences, although they influence reading, do not necessarily interfere with reading. Hudelson (1984) has also indicated that "ESL learners are able to read English before they have complete oral control of the language" (p.224) and that "even children who speak no or very little English are reading some of the print in their environment and are using that reading to increase their English" (p.222). Non-native speakers of English, therefore, can learn to read English while they are learning the language, and they can also learn the language as they learn to read it. In short, language and reading instruction can support each other (K. Goodman, Y. Goodman, and Flores, 1979; Robson, 1981; Hudelson, 1984).

However, of interest to me as a would-be teacher in a college environment is the notion of the "automated" reader (Kintsch and van Dijk, 1978), i.e. readers who are quite proficient in the langauge in which they are reading, be it first or second. My concentration on the fluent reader is based on the fact that many of the so-called "fluent" readers are still incapable of reading for comprehension. The problem becomes more prominent when they have to read for information and without the teacher close at hand to help them. Their reading incapability could only frustrate

their efforts in this area. It is also these fluent or automated reader who will have to diligently access and control schema selection, schema instantiation, and schema refinement (Spiro, 1980). As knowledge of what to teach is important to the ESL teachers, so is the knowledge of schema-theory necessary to ensure better interfacing of what is in his or her student's mind and what is on the printed page, and also what is taught is not disjointed nor the various strategies used in teaching reading seen as unrelated "chips" incapable of forming a coherent whole in this psycholinguistic language game.

APPENDIX A

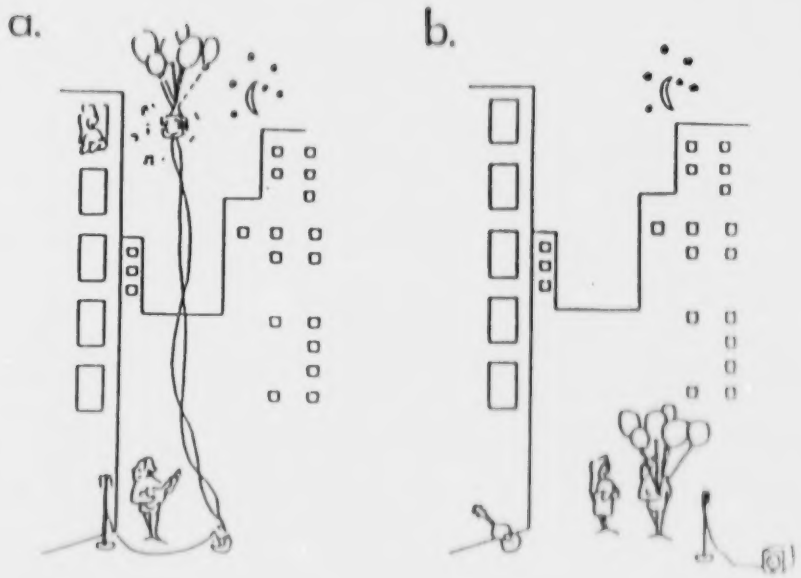

Figure 1. Illustrations from Bransford and Johnson (1972). Version "a" represents the appropriate context and version "b" represents the inappropriate context. See text for accompanying passage.

Text:

If the balloons popped the sound wouldn't be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying, since most buildings tend to be well insulated. Since the whole operation depends upon a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course, the fellow could shout, but the human voice is not loud enough to carry that far. An additional problem is that a string could break on the instrument. Then there could be no accompaniment to the message. It is clear that the best situation would involve less distance. Then there would be fewer potential problems. With face to face contact, the least number of things could go wrong (p.719).

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